

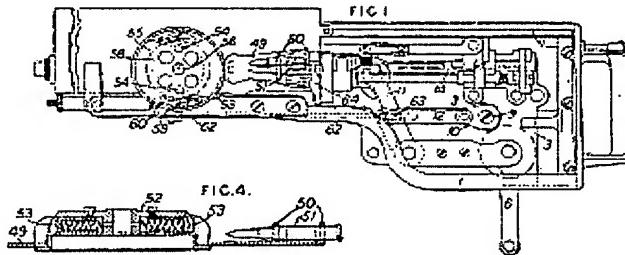
Improvements in Cartridge Feed Mechanism and Magazines for Machine Guns

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Inventor: LUCAS OWEN DAVID (GB)
Applicant: LUCAS OWEN DAVID (GB)
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 - european: F41A9/26
Application number: GB19160011611 19150921
Priority number(s): GB19160011611 19150921

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Abstract of GB123773

123,773. Lucas, O. D. Sept. 21, 1915.
 Machine guns; cartridge magazines.-Relates to feed-mechanism for cartridge magazines which have the cartridges arranged radially therein, and from which the cartridges are withdrawn and inserted into the gun chamber. The invention consists in providing a ratchet wheel carrying the magazine, the pawl engaging the ratchet wheel being actuated by a spring during the forward movement of the action bolt. Fig. 1 shows the invention applied to the hand-operated machine gun described in Specification 13446/15, in which the breech-frame 3 recoils against the action of a spring in a fixed frame 1 and carries an operating crank 6 which, through a two-to-one gear, rotates a crank-shaft 9, the crank 10 of which is connected by a slotted link 12 to a lever 11 actuating the sliding breech-bolt 14. The cartridge magazine 49, a portion of which is shown in Figs. 1 and 4, is of annular disk formation, the cartridge ridges being held radially by spring clips 51 when pushed through holes in projection rings 50. The recesses on the inner circumference of the disk 49 enable the magazine to be readily attached to a carrier 52, as shown in Fig. 4, by pushing it over spring pins 53, the carrier fitting over pins 54 carried by a ratchet wheel 55 free to rotate on a pin 56 fixed to the gun casing. The ratchet wheel is rotated by a pawl 59 carried by a ring 58 freely mounted on the spindle 56, this ring, when the breech-bolt moves rearwards, being given an idle anti-clockwise movement against the action of a spring 60 by a rod 62 having a slotted link connexion with a pin 63 on the breech-bolt-actuating lever 11. When the breech-bolt moves forwards, the re-action of the spring 60 causes the pawl 59 to rotate



the magazine clockwise to bring each cartridge into the extracting position determined by a stop 64, even if a cartridge should be missing from one of the spaces in the magazine.

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PATENT



SPECIFICATION

Application Date, Sept. 21, 1915. No. 11,611/16.

" " Apr. 20, 1916. No. 11,612/16.

One Complete Specification Left, Apr. 25, 1916.

Complete Accepted, Mar. 13, 1919.

PROVISIONAL SPECIFICATION.

No. 11,611, A.D. 1916.

Improvements in Cartridge Feed Mechanism and Magazines for Machine Guns.

I, OWEN DAVID LUCAS, of 49, Linden Gardens, London, W., Consulting Engineer, do hereby declare the nature of this invention to be as follows:

This invention relates to machine gun magazines of the type which has a number of cartridges arranged radially in it and which is rotated step by 5 step to present the cartridges in turn at the required place.

The magazine consists of an annular plate having projecting out from it two rings, in each of which is a series of holes, into which cartridges can be inserted with the bullets towards the centre and the shoulders of the cases fitting against the outer surface of the inner ring, while the heads of the cartridges are slightly outside the outer ring. A small arc of the plate is 10 unoccupied by cartridges and when the plate is full this arc lies in front of the mechanism for withdrawing the cartridges from the magazine. A cover in the form of a hoop surrounds the periphery of the magazine and prevents the cartridges from falling out; the hoop has an inturned annular flange 15 adapted to be engaged by a pair of catches carried by the inner ring, one of which catches is mounted on a spring, so that the cover can be slipped into place on the magazine which is then free to rotate within it. The hoop has an aperture in it to allow of the cartridges being withdrawn and is provided with a blade spring adapted to support the head of the cartridge opposite the 20 aperture and to prevent it from falling out when the gun is at a high angle of elevation or from being jerked out by the recoil.

The magazine is carried by a hub mounted on a horizontal transverse stud on the left of the water jacket or barrel casing. On the hub are two spring plungers so arranged that the magazine can be pushed on to the hub on which 25 it is positioned by keys: it is then retained by the catches but can be withdrawn by a sharp pull. On the hub are cut ratchet teeth engaged by a spring pawl carried by an arm loosely mounted upon the stud and rocked by means of a longitudinal slotted rod which is moved to and fro by means of a pin on the rocking lever which actuates the bolt. A spring is interposed between a 30 collar on this rod and the arm and the movement of the rod is more than sufficient to rotate the magazine through the angle between two cartridges. Normally the first part of the forward movement of the rod brings a new cartridge into position, the magazine being stopped by the cartridge coming against a stop, and the rest of the movement of the rod merely compresses the spring,

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but should a cartridge be missing from one pair of holes in the two rings, the magazine is rotated to bring the next cartridge into position. This arrangement has the further advantage that it is not necessary accurately to cut the ratchet teeth to correspond with the angle between two adjacent cartridges.

Dated the 31st day of July, 1916.

OWEN D. LUCAS.

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PROVISIONAL SPECIFICATION.

No. 11,612, A.D. 1916.

Improvements in Cartridge Feed Mechanism and Magazines for Machine Guns.

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I, OWEN DAVID LUCAS, of 49, Linden Gardens, London, W., Consulting Engineer, do hereby declare the nature of this invention to be as follows:—

This invention relates to machine gun magazines of the type which has a number of cartridges arranged radially in it and which is rotated step by step to present the cartridges in turn at the required place.

The magazine is formed of a plate having two flanges extending at right angles to it. Between these is a series of spring clips which hold the cartridges when they are pushed through holes in the flanges. The central part of the plate is cut away and its interior periphery is serrated so that the magazine can be pushed on to a magazine carrier in which are mounted two spring plungers adapted to engage the serrations and hold the magazine firmly in position. When it is desired, however, to remove the magazine, this can readily be done by giving it a sharp pull.

The carrier has two holes cut in it so that it can fit upon pins projecting from the face of a ratchet wheel loosely mounted on a stud projecting laterally from the left side of the water jacket. Loose on this stud is an arm the end of which carries a driving pawl and is connected to a magazine spring and also by a cranked and slotted rod to a longitudinal rod the rear end of which is slotted to embrace the pin which is on the bolt actuating lever and works it. As therefore the extractor begins to move rearward, the rod also moves rearward and rocks the arm in an anticlockwise direction extending the spring, while the pawl rides over the teeth of the ratchet, but as soon as the extractor begins to move forward, the spring moves the arm back rotating the ratchet and therefore the magazine until stopped by the next cartridge coming against a stop by which such cartridge is held in position ready to be engaged by one of the pairs of jaws in the extractor.

It will be understood that sufficient movement is imparted to the rod to cause the driving pawl to ride over a number of teeth and therefore the magazine will be rotated to bring a new cartridge into position should the magazine have been carelessly loaded and a cartridge omitted from one or two places. Moreover, owing to the fact that the magazine is rotated during the forward movement of the extractor and is free during the rearward movement thereof, there is no possibility of the cartridge which is being extracted being pressed upon by the cartridge next to come into place.

Dated the 31st day of July, 1916.

OWEN D. LUCAS.

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COMPLETE SPECIFICATION.

Improvements in Cartridge Feed Mechanism and Magazines for Machine Guns.

I, OWEN DAVID LUCAS, of 49, Linden Gardens, London, W., Consulting Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 This invention relates to machine gun magazines of the type which has a number of cartridges arranged radially in it and which is rotated step by step to present the cartridges in turn to a certain position from which they are withdrawn to be subsequently inserted into the chamber.

The object of this invention is to provide a magazine of this type in which 10 the parts shall be as few and simple as possible and in which the drive shall be such that the magazine would be rotated to bring a new cartridge into position even should the magazine have been carelessly loaded and a cartridge omitted from one or two places.

A magazine constructed in accordance with this invention is shown in the accompanying drawings as applied to the machine gun described in my Complete Specification No. 13,446 of 1915. Figure 1 is a left hand elevation with the side cover removed; only such parts as are concerned with the magazine and the means for operating it are referred to below. Figure 2 is an elevation of the magazine. Figure 3 shows the magazine carrier and Figure 4 is a 20 section through the magazine and carrier, while Figure 5 shows the magazine drive.

1 is the main frame having formed upon it guide surfaces 2 on which slides a breech frame 3 which is fast with the breech and in which is journaled a shaft 5 provided with an operating handle 6 and having mounted 25 upon it a toothed wheel 7 meshing with a pinion 8 on a shaft 9 on the left of which is a crank 10. There are twice as many teeth on the wheel 7 as on the pinion 8 so that the gun fires two rounds for each revolution of the handle, but it is obvious that the handle might be arranged on the shaft 9 in which case the gun would fire once for each revolution. A bolt actuating lever 11 30 is pivoted on the frame 3 and is connected by a slotted link 12 to the crank 10.

The cartridges are carried by a rotary magazine formed of a plate 49 having two flanges 50 extending at right angles to it. Between these is a series of spring clips 51 which hold the cartridges when they are pushed through holes in the flanges. The central part of the plate 49 is cut away and its interior 35 periphery is serrated so that the magazine can be pushed on to a magazine carrier 52 in which are mounted two spring plungers 53 adapted to engage the serrations and hold the magazine firmly in position. When it is desired, however, to remove the magazine, this can readily be done by giving it a sharp pull.

40 The carrier 52 has two holes cut in it so that it can fit upon pins 54 projecting from the face of a ratchet wheel 55 loosely mounted on a stud 56 projecting laterally from the left side of the water jacket 57. Loose on this stud is an arm 58 the end of which carries a driving pawl 59 and is connected to a magazine spring 60 and also by a cranked and slotted rod 61 to a longitudinal 45 rod 62 the rear end of which is slotted to embrace the pin 63 which is on the bolt actuating lever 11 and works in the slot of the link 12. As therefore the bolt begins to move rearward, the pin 63 travels idly in the slot of the rod 62, but when the pin reaches the rear end of the slot the rod 62 also moves rearward and rocks the arm 58 in an anticlockwise direction extending the

spring 60, while the pawl rides over the teeth of the ratchet, but as soon as the bolt begins to move forward, the spring 60 moves the arm 58 back rotating the ratchet and therefore the magazine until the latter is stopped by the next cartridge coming against a stop 64 by which such cartridge is held in position ready to be engaged by an extractor plate 32 moving with the bolt.

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It will be understood that sufficient movement is imparted to the rod 62 to cause the driving pawl to ride over a number of teeth and therefore the magazine will be rotated to bring a new cartridge into position even should the magazine have been carelessly loaded and a cartridge omitted from one or two places. Moreover, owing to the fact that the magazine is rotated during the forward movement of the extractor and is free during the rearward movement thereof, there is no possibility of the cartridge which is being extracted being pressed upon by the cartridge next to come into place. 590 is a detent to prevent backward rotation of the magazine.

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Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a machine gun fitted with a rotary magazine of the type referred to, the combination of a ratchet wheel carrying the magazine, a pawl adapted to drive the ratchet wheel and a spring adapted to actuate the pawl during the forward movement of the bolt, substantially as described.
2. In a machine gun fitted with a rotary magazine of the type referred to, the combination of a ratchet wheel carrying the magazine, an arm mounted coaxially with the wheel, a driving pawl carried by the arm, a spring connected to the arm and means for arming the spring during the rearward travel of the extractor and for allowing it to turn the arm so as to rotate the magazine during the forward travel of the extractor, substantially as described.
3. Mechanism covered by Claim 1 in which the pawl is moved over a plurality of teeth so that should a cartridge be missing from the magazine, the latter will be rotated sufficiently to bring the next cartridge into position.

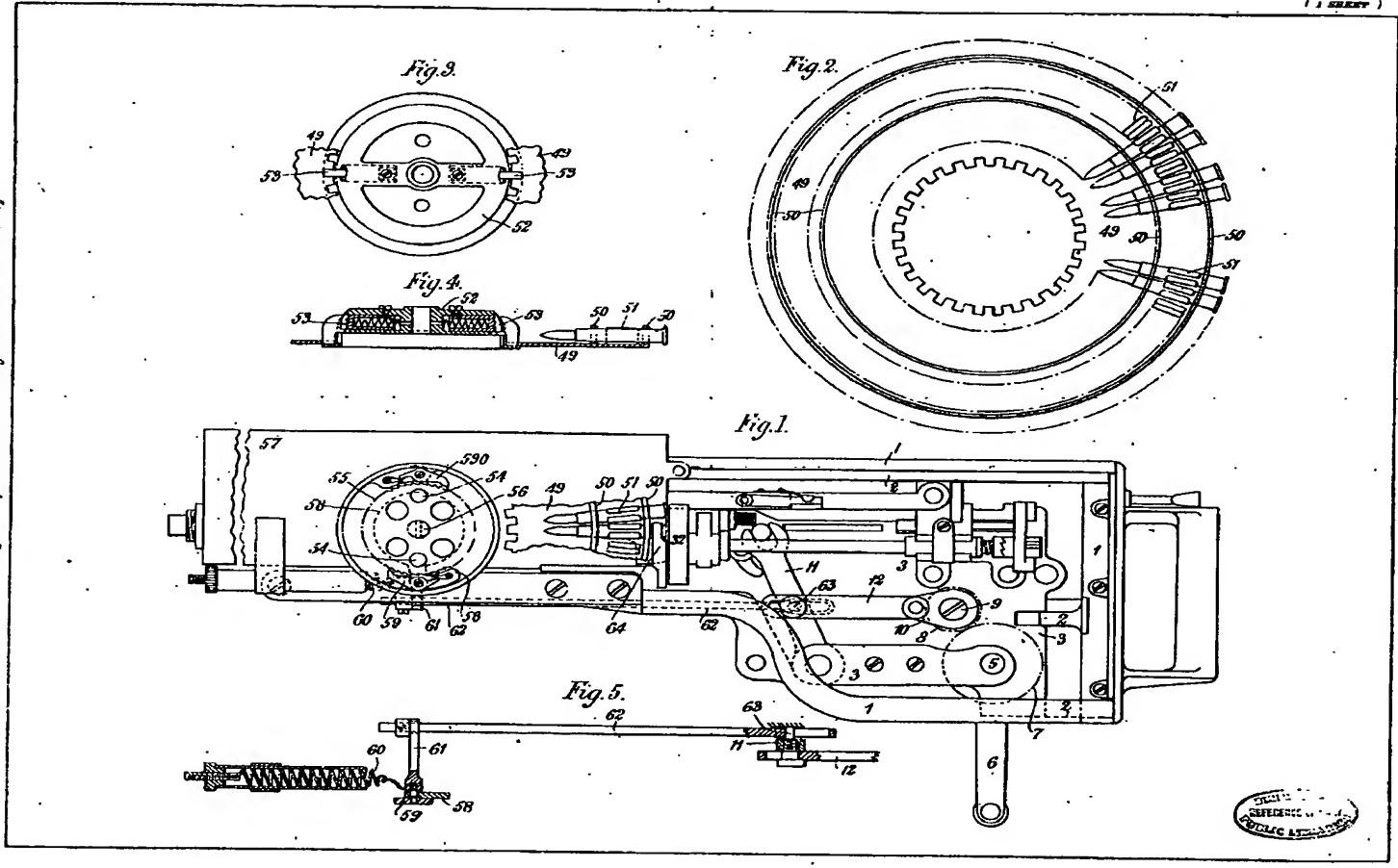
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Dated the 31st day of July, 1916.

CARPMAEL & Co.,
Agents for Applicant,
24, Southampton Buildings, London, W.C.

123,773. LUCAS' COMPLETE SPECIFICATION.

This Drawing is a reproduction of the Original on a reduced scale.



[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 3.

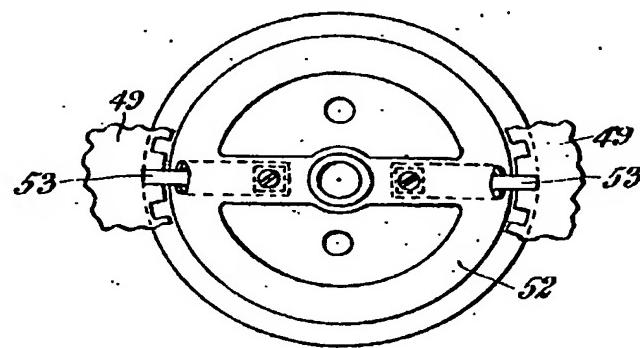


Fig. 4.

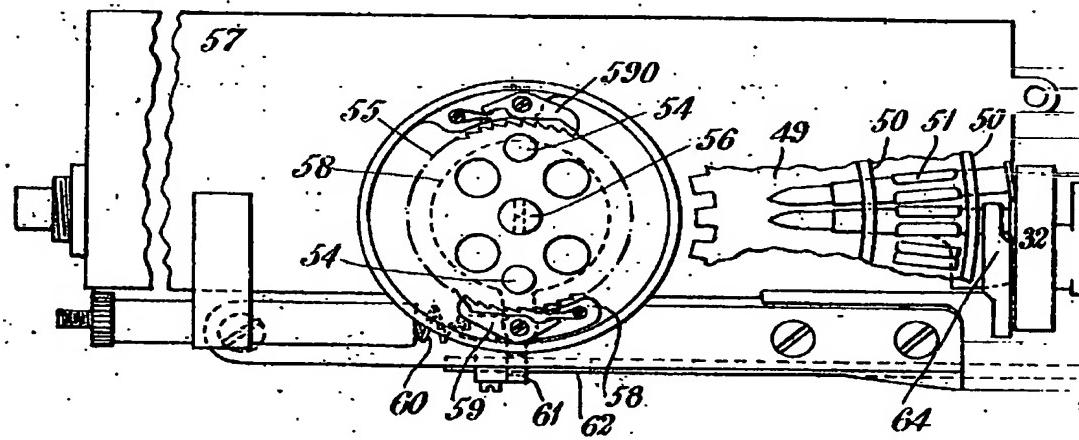
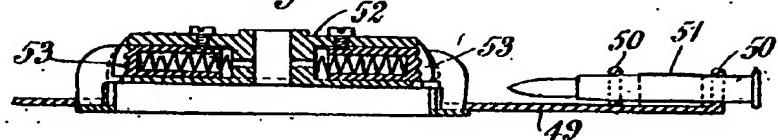


Fig. 5.

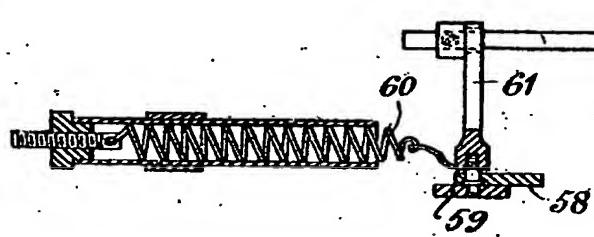


Fig. 2.

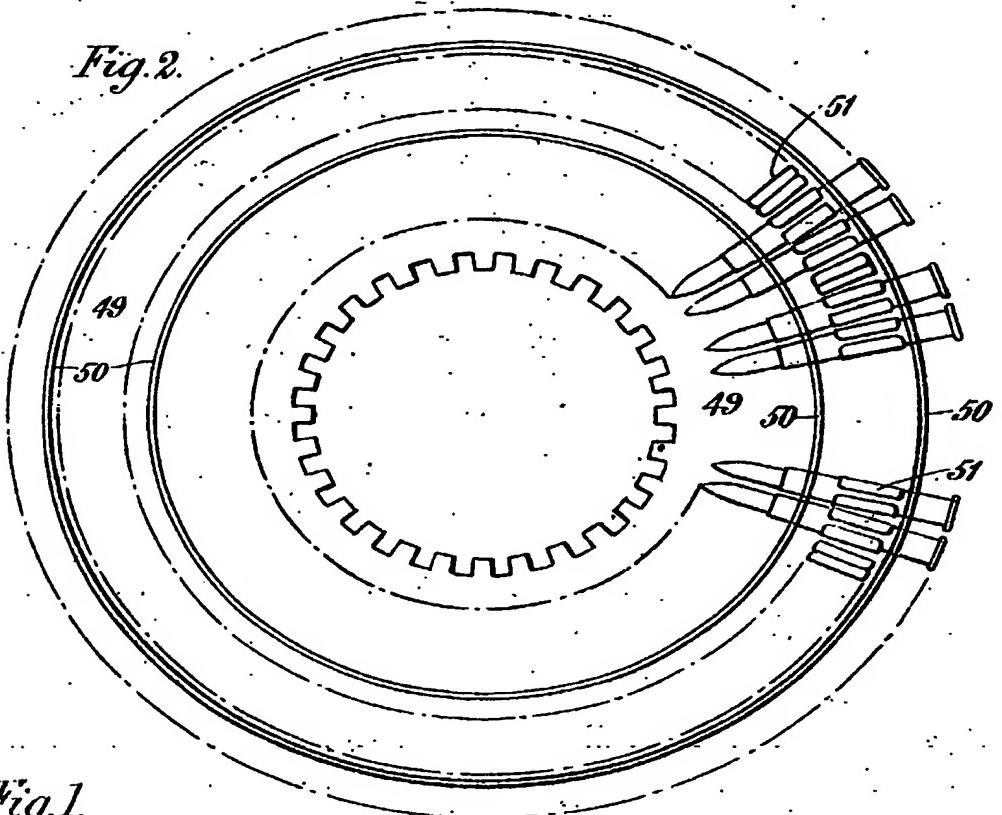
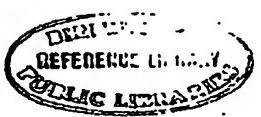
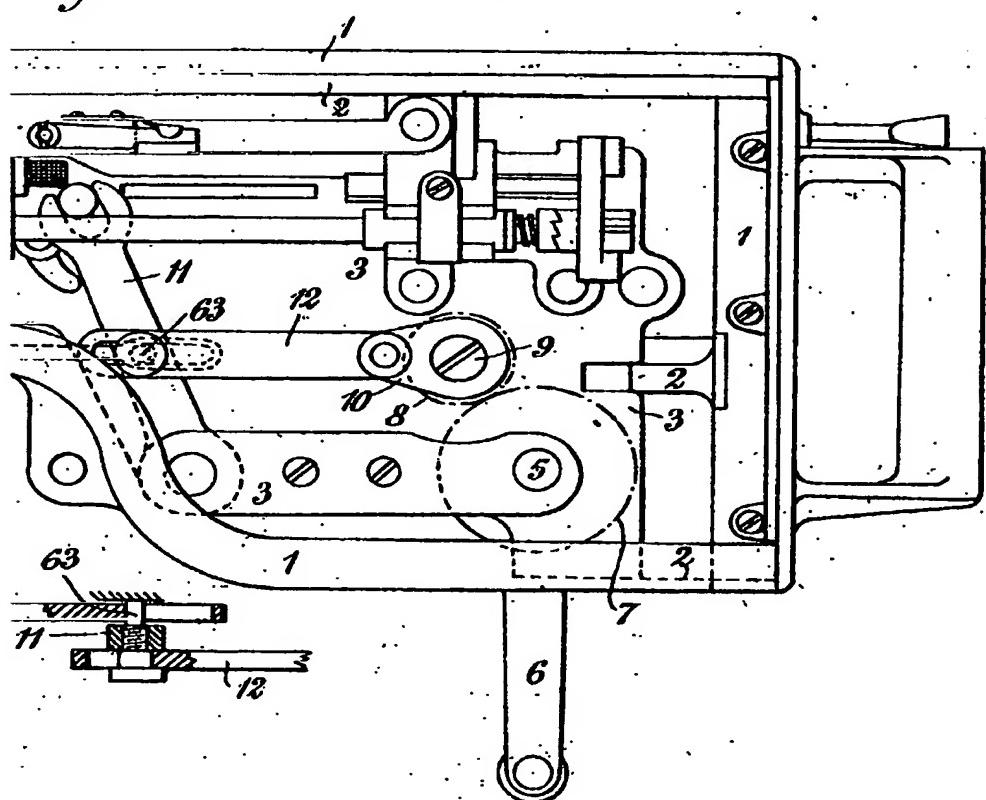


Fig. 1.



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